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ABSTRACT

By comparing the strategies involved in creating a poem and in writing a government report, this paper presents a model of reading and writing processes for exploring the relationship between literature and technical writing and for pointing out the similarities in the use of texts. The model assumes that the student approaches a piece of writing in a conventional manner and with certain expectations about its meaning. The teacher's task is to present the typical patterns of language and to apply strategies for mediation between such patterns and a unique language situation. In this process, students come to understand the author's individual mode of expression and at the same time develop confidence in their own unique identity. The paper compares the poem "Ghosts," by Elisabeth Jennings, with "Treasure from the Sea," a report published by the United States Naval Oceanographic Office, showing that both writing samples present a conventional statement to be considered immediately, both limit the message selectively to serve the author's purpose, and both present material containing regularities, recurrences, and balanced equivalences. (HAI)

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LITERATURE AND TECHNICAL WRITING *

The large, complex universities of our time often create an impression of diversity rather than unity in terms of academic experience. Students might assume that the humanities on the one hand and the sciences on the other are necessarily unrelated, or possibly even antagonistic, as Matthew Arnold in "Literature and Science" surmised. By investigating samples of the language media of these two areas, namely literature and technical writing, I shall try to show why such an assumption is inaccurate. I hold that the language training and awareness provided through literature are indeed capable of meaningful interaction with those provided in the sciences.

To make this point clear, I shall briefly present a model of the processes of reading and writing, drawing upon recent insights in such areas as linguistics, information theory, communications, psychology, and literary studies. The model will show that, despite diversities in such matters as selection of topics and outward appearances of various texts, the processes involved in the use of texts are essentially similar.

I shall begin with writing as a form of text production. This production is motivated firstly by a set of assumptions about the prospective reader audience, that is, about its background, knowledge, attitudes, and interests, and secondly, by the intention to effect some change upon one or more of these factors.[1] Conversely, readers proceed upon the basis of a set of assumptions about the production of texts. Successful communication demands that both writers and readers share some consensus about each other's assumptions and about the extent to which the latter will or will not be fulfilled by a given text. The type and purpose of writing stand in direct relation to the ratio

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of fulfillment and non-fulfillment of expectations.

There are at least three levels of generality at which expectations can exist. Every language user possesses some knowledge about the model of reality accepted in a group or society and about the ways in which the language of the group or society reflects that model of reality in its grammar and vocabulary.[2] This very general level constitutes the background for the production and reception of texts. A more specific level, that of text type, subsumes the expectations that are activated as soon as a topic and its mode of presentation in a recognizable kind of text, are established. The most specific level is that of the situation in which people actually communicate by means of a text, including the relationship of writer to reader, their attitudes about the topic and the text form, and the effects which the text is intended to elicit. Disregarding marginal cases such as letters between close friends and married couples who can guess each other's every word, we can assume that a text must fail to fulfill at least some of the reader's expectations in order to communicate anything not totally obvious or already known.[3]

The interaction of these various levels of expectations with the production and reception of texts is quite complex. There seem to exist at the highest level of generality pre-stored patterns and (to use a term of computer technology)[4] programs of expression. Here we find conventional beliefs of a community, but also typical syntactic and grammatical patterns, possibly analogous to the "well-formed utterances" posited by transformational grammarians. Yet in contrast to the postulates of standard transformational theory, it does not appear that these pre-stored patterns directly and completely control the use of texts in real life. Instead, actual language use only approximates the criteria and parameters drawn by the patterns. Herein lies the infinitely

creative aspect of language use and the range for inventing unique and original texts.

If the background of language patterns need not be openly manifested in texts, it follows that a writer or a reader must command a set of strategies for mediating between the pre-stored patterns and the immediate needs to communicate and interact with other people in real life situations. In certain types of situations, such as literary communication as distinct from technical communication, these strategies may manifest themselves in ways and proportions characteristic of each individual type. But I maintain that the strategies themselves are essentially the same and that if this fact is made clear in the English class, training in one area is indeed useful for developing skills in other areas.

According to current research in theoretical grammar and semiotics,[5] the act of reading consists in assigning structures (in the broad sense of: perceptible relationships between component elements of some whole) to texts. In this process of "structuration," similarities and differences — or, to use current terminology, "equivalences" and "oppositions"[6] — are perceived and assigned some meaning and relevance to the act of communication overall. For example, readers perceive grammatical features as signals for discovering the internal organization of the information in the text. The language elements are "contextualised," that is, their total ranges of possible meaning and use are reduced and co-ordinated so as to obtain the meaning of a particular text. Recent experiments in language psychology[7] indicate the existence of a process in which the text is mentally summarized and reduced to a large-scale record of what has been expressed. Such processes as the aforementioned can be performed easily or even automatically because of the availability of such assumptions and pre-stored patterns as I have already cited. Obviously,

a reader who proceeds automatically or nearly so tends to focus upon the more conventional aspects of the text and to lose sight of its uniqueness and originality. If a writer wants to put across an unconventional message, it is expedient to block automatic processing or slow it down by using unexpected features of language.

This insight underlies numerous contributions to poetics and theory of literature. Jan Mukařovský reasoned that poetic use of language brings about "foregrounding," increased concentration upon the detailed features of a text.[8] Michael Riffaterre tried to define the stylistic feature as an unpredictable element.[9] Samuel R. Levin distinguished between non-fulfillment of expectations (or as he said: "deviation from a norm") established either inside or else outside the confines of a given text.[10] Transformational grammar was used as a model for determining the "grammaticality" of poetry.[11]

In discussing our text sample here, I shall make use of and modify these theories as follows: 1) the effectiveness of texts is derived from fulfillment just as much as non-fulfillment of expectations: indeed, a text which did nothing but disappoint expectations could not be understood at all; 2) I shall try to make a distinction between the expectations at the various levels described above: for example, what is not expected at the general level of ordinary language maybe fully expected in some special text type, such as rhyme in poetry; the most powerful effects are obtained by working with the expectations created within the individual text itself; 3) thirdly, the relationship between what is expected and what then actually occurs at some point is very significant, even if the reader could not specify the exact words of a fully normal version.[12]

It has been widely assumed that the processes of reading and writing are the same, the one being simply the reversal of the other. In basic models derived from communication technology, researchers would speak of a "message"

being "encoded" by the writer into "symbols" and then "decoded" by the reader. This mechanical viewpoint accorded well with the methods of descriptive linguistics with its intention to study only form, not meaning, and with those of transformational grammar with its automatic sequences of formal "rules" for "generating utterances." But the mechanical viewpoint cannot account for the differences between abstract models and real language and tells us little about what writers and readers actually do. In particular, the mechanical model does not tell us what language teachers can do to affect language skills among students. If texts are "generated" and comprehended by application of abstract rules to remote "deep structures," what is left for the teacher to do?

To answer this important question, let us return to the concept of expectations. A writer who selects a topic will naturally tend to produce a rough draft which, in some ways at least, is closely dependent upon conventional patterns. Only during revision, at a time when the writer has a detailed view of the text's features and inner relationships, can the text be made to fit the exact and unique situation at hand. Thus the teacher's tasks would be: 1) to present and discuss the typical patterns of a language, and 2) to present and apply strategies for mediating between such patterns and a unique language situation. We can likewise assume that a reader at first tends to interpret a text in close relationship to conventional patterns and personal past experience, and only during further, more intense reading, such as is performed by literary scholars, does the reader take the specific and unique features of the text into full account.[13] In this viewpoint, the strategies of mediating between the conventional and the individual work in the same direction as in writing, rather than the reverse. The difference between two papers written on the same assigned topic or two

readings of the same poem derive not only from differences in personal language experience of students, but also from the extent to which the progression from the conventional toward the individual is pursued and continued. If the English class is centered upon the strategies involved in this progression, the students will receive the training needed to realize themselves as true individuals and special beings rather than manifestations of conventional stereotypes, whether the class be creative writing, technical writing, or literature appreciation. Indeed, the study of literature as a demonstration of how authors gave themselves identity through language, identity distinct from all other human beings, offers vast potential for emancipating the modern student from the confines of habits and patterns.

I would like to demonstrate this point with a comparative investigation of our sample texts. If what I have said so far is correct, we should be able to discover the same or comparable strategies at work in the writing processes of both a poet and a technical writer. The application of such strategies may be more dense in a poem, but the poem is also shorter and more memorable.

GHOSTS

Those houses haunt in which we leave

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Let us imagine a reader approaching this text by the contemporary poetess Elisabeth Jennings (born 1926). The very appearance of the text on the page at once announces that a poem, seemingly a sonnet, is forthcoming. However, the expectations activated about sonnets are not all fulfilled here. Instead of a typical division of eight lines followed by six, we have nine lines followed by five. The first stanza does not participate in the full rime scheme Yet if the reader then assumes that the poem is not going to rhyme at all, the second stanza proves the contrary. As reinforcement, the first line in which the lack of rhyme becomes apparent, namely line three, contains the word 'silence', while line four, which begins a rhyme sequence, contains the word 'echoes'. The rhythm is broken only at the beginnings of lines two and six, helping to alert the reader that the unrhythmic elements 'something' and 'ghosts' are to be defined or described in an unexpected way. The last two stanzas are tightly interwoven by alternating rhymes whose regularity is intensified by the use of verbs describing the activities of ghosts as rhyme words. Also, each sentence-like phrase fills exactly one line, which was not the case in the first part of the poem. The transition from irregularity in the first three stanzas to regularity in the last two agrees with the relationship of the message to the reader's expectations. In the first part, the message was new and unconvnetional. The second part restates and reaffirms this now no longer unexpected message and confirms the newly aroused expectations by means of formal predictability as well.

Expectations about normal English usage are also disappointed in various ways. The reader at first may take 'those houses' as the subject of the first sentence in accordance with its placement, only to find out that the subject has in fact appeared in the poem's title and that this element is the direct object. This displacement creates focus upon an otherwise unpretentious element

and thus produces an expectation which is immediately confirmed: that the houses in question are not those we conventionally expect to be haunted.* Instead of being the scene of remarkable deeds or crimes, these houses are the locations where a deed was omitted. The second sentence opens with a a forceful focusing phrase often called the "cleft-sentence" construction. It draws attention to the "predicate noun" or nouns, in this case 'great words and silences of love'. The negation in the opening phrase is explicitly leveled at what the author assumes to be a reader expectation about ghosts and about the topics of sonnets. Thus it is denied that ghosts frequent the places where 'great words and silences of love' have occurred and at the same time, that this sonnet is going to treat any such conventional topics as these. The negation itself establishes a new internal pattern which is confirmed by three more uses of 'not' as well as of a series of terms which are defined by a lack or an absence: 'undone, silences, unbreathed, omissions, helplessness, refusal'. In the area of grammar and syntax, the same shift from irregularity to regularity is observed as was noted regarding poetic form, reinforcing once again the shift from new information to already stated information. If we take the semicolon in line 7 as a sentence divider, we see that the four sentences of the first part are all very different in structure: one displaced sentence, a "cleft" construction with two relative clauses, a non-cleft sentence with a relative clause, and finally a normal-order sentence with an infinitive phrase. In contrast, the sentences or sentence-like groups of the second part are of the same length save the last, which is a doubling, and of very similar grammatical structure. The first two in lines ten and eleven are entirely identical, with alliteration also falling in identical positions. The third (line 12) has only the small shift that the unit of noun as object of a following relative clause verb is replaced by

* Lawrence O'Toole , Universitz of Essex (personal communication) suggests that the ambiguity lingers: 'haunt' could be an intransitive verb with 'Those houses as subject', i.e.: those houses haunt us...'

by noun plus modifier; but the shift is minimized by the fact that this noun is virtually a restatement of the noun plus relative clause in line ten. The structure of the last two lines is similarly obtained by simple shifts. The relative clause appears in final rather than middle position, while the "cleft" construction fills out the initial slot. However, the verbs whose subjects are all identical, both in form and reference, are kept at the end of each line. The verb of the last clause is identical with the verb of the first. And the cleft construction of the last sentence balances out the negative cleft sentence above, creating a feeling of an ending.

The expectations set up in the first part are strikingly fulfilled in the second with still other means. The activities of ghosts rejected in the first part are described initially in terms of the audible (lines 2-5) and then in terms of the visible (lines 6-9). The second part which goes on to name the activities of ghosts as affirmed by the author maintains an exact balance between audible and visible perspectives, alternating from line to line: 'words, silences, refusals' are set against 'deeds' and 'helplessness'.

We can conclude that the strategies followed in creating this poem are closely allied to what a reader would expect at any given point. The basic plan was to introduce an unexpected message within an unpredictable formal arrangement, and then to support the statement by material containing regularities, recurrences, and balances.

Let us now turn to the sample of technical writing, taken from a report published by the U.S. Naval Oceanographic Office.[14]

TREASURE FROM THE SEA

3 The sea is "water" only in the sense that water is the dominant substance present. Actually, it is a solution of gases and salts in addition to vast numbers of living organisms, the majority of which are quite minute. Since the beginning, materials in solution and in suspension, carried by rivers, have been deposited in the oceans and seas of the

world. It is to the wealth related directly and indirectly to these materials that this article is directed, rather than to pirate treasure.

It should not seem strange to consider the sea as a vast mineral mine. For, our oceanic waters contain more minerals than have ever been mined by man.

On land, when minerals are taken from mines, they are not replaced. And as this ore is used up, industry is forced to use lower and lower grades, making extraction more difficult and expensive.

Such, however, is not the case with our seas. For, as previously mentioned, the sea is great reservoir constantly receiving the products of erosion, decay, and runoff. Although in great dilution, here is a source of almost limitless amounts of all the minerals and metals we use.

Mining the endless resources of the sea is not a nebulous hope, but rather a growing actuality, with continued expansion — the frontier of chemists.

The potentials of Neptune's treasure are vast. Minerals and chemicals exist beyond one's comprehension. Food is available in quantities more than sufficient to lift all of the world's wants.

Our conquest and understanding of inner space may well prove to be more important to our very existence than the greatest achievements in outer space.

The audience of this text consists of high school students, as the preface (not shown here) makes clear. The purpose of the text: to interest these students in a future career in maritime chemistry, is accomplished by very skillful use of both information and language.

The text fragments shown here include the title and opening paragraph, a series of four paragraphs occuring very soon after, and finally, the last two paragraphs of the eight-page report. The body of the report, coming between the second and third fragments, presents the sea's resources in selective details. Now, the very first word of the title creates a set of expectations. The word "treasure" is not usually applied to materials obtained by mining, but rather to precious objectshidden away and waiting to be found and carried off. To equate the sea's components with "treasure" is to activate conventional beliefs which suggest: 1) that the components are highly valuable and stored in a convenient, concentrated form; 2) that their discovery and enjoyment requires only a good set of directions; and 3) that

the treasure belongs to no one particular by right. Rather than correcting these beliefs, the author exploits them to convey his message, using some of the same techniques and strategies as we saw at work in the poem.

Like the poem, the opening sentence of this text presents a conventional statement to be immediately reconsidered. Just as we all know that ghosts are supposed to haunt houses, we are not surprised to hear that 'the sea is water', or rather, surprised that anyone would bother to tell us so. The use of quotation marks around "water" perform the same function as the breaking of syntactic patterning with 'those houses' or of rhythmic patterning by 'something' and 'ghosts' (in line 6) in the poem: the reader is alerted that there is something unexpected about this particular "water" or these particular 'houses'. The next signal to the same effect is that of limitation. The poem admits of ghosts only in 'those houses', and (in line 7ff.) assigns them 'only' those activites, which are compatible with the author's message. Here we find that the sea's being water is 'only' true in the sense that suits this author. In the poem, the second sentence began with a marked signal that the reader would be asked to correct an expectation: 'it is not...'; the 'actually' here performs exactly the same function. The reader is presented a non-conventional definition of the sea that will allow the author's later assertions to appear as statements of facts dictated by nature, instead of a very special interpretation of facts. This intention accounts for the sudden introduction of scientific terminology which is just as suddenly toned down again afterwards: 'gases, salts, organisms, minute'. The explanation of how these 'materials' were 'deposited' in the sea like in a bank vault affirms the tendency to suggest that the materials are endless and belong to no one; like pirate treasure, they were 'carried' and left there. The final sentence of the paragraph begins with a "cleft" construction to focus on a major term

not introduced before, namely 'wealth'. Attention is further called to this term by the syntactic displacements needed to bring it to the front, it being the object of a preposition dependent upon a verbal phrase ('is directed') occuring at the very end of that syntactic group ending with the comma (line 7). The equation of 'wealth' with the sea's 'materials' is accomplished by use of unexpected language also: a series of relational words with a remarkably dense accumulation of rhyme and recurrent features: 'related, directly, indirectly, directed'. The paragraph terminates with the same balancing of end against beginning that we saw in the poem: here, indeed, the same word is both first and last. Thus, even if the author disclaims his intention to write about 'pirate treasure', he conveys the message that he will be writing about treasure that might resemble pirate treasure so much that this preliminary warning could be needed.

The second sequence of text shows a similarly strategic planning. Right away, a cleft construction is used to announce that the readers should alter their belief if they find the forthcoming statement strange. A new definition of the sea is offered which agrees with the earlier one in the text but not very well with conventional views. The equivalence that is established here is reinforced once again by a typically poetic means, an accumulation of sounds in alliteration still more remarakble than the previous instance. Despite the fact that 'mine' is defined as "a pit or excavation in the earth from which mineral substances are taken" (Websters),[15] the author persists in writing of a 'mineral mine' and reiterating this combination with a small intervening space and a parallel addition of endings as 'minerals...mined'. and again as 'minerals...mines'. We thus have a deliberately inflated alliteration series: 'mineral, mine, more, minerals, mined, man, minerals, mines, making, more, mentioned, minerals, metals, mining'. The effect is very

like the accumulation of minerals at the ocean bottom. It should be noted that the whole text is inflated with balanced equivalences which do not add much information where they appear: 'in solution and in suspension'(4), 'oceans and seas' (5), 'difficult and expensive' (13), 'minerals and metals' (17), 'minerals and chemicals' (21), 'conquest and understanding'(24).

As a classic illustration of selectivity in providing information, the author mentions only the difference between land and sea mining that supports his intentions, namely that the sea's resources are replaced — a powerful argument in an age of ecological awareness, yet supportive of the carefree treasure-hunt attitude already noticed. The terms 'limitless' and 'endless' are used as the strategically best point. Now, as we know, treasure hunting is an uncertain business. But the author, foreseeing this objection, hastens to deny that he is holding out 'a nebulous hope'. Instead it is something conveyed in a balanced, redundant phrase whose first and last terms are identical in meaning: 'growing actuality with continued expansion'. And at last the author reveals who is going to collect the treasure first: chemists. It is significant in this connection that the author has been vague thus far about ownership. 'The sea' suddenly becomes 'our oceanic waters' (9) and later 'our seas' filled with 'metals we use'. It is not typical of the military to speak in the first person and mean the whole world. We note for example that the final sentence of the article suggests that the navy should receive more research support than the air force and the space program.

The final passage confirms what we have observed so far: more vagueness about the ownership of the 'treasure', more superlatives about the extent of the treasure, more balanced equivalences of form and word selection. I should remark that 'food' here follows up some omitted passages where the author

interpreted the minute organisms and even the sea's very water as treasures to be exploited. The final sentence with its neat use of the same form and the opposite meaning in 'inner space' and 'outer space', each at the end of an intonational group, reminds us of the couplet that ends a Shakespearean sonnet.

I hope my original point has been well taken. We must not let the diversities of topic or text presentation blind us to the fact that the poets are doing many of the same things for the same reasons as technical writers. In this awareness, we can no longer be imposed upon by assertions that literature and poetry can have no place in a technical world and in its institutions of higher education.

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- notes -

[1] My definition of the motivation of discourse accords with the model used by Kenneth Pike and other tagmemists, as well as with recent attempts to study language in the framework of action theory. See Kenneth Pike, Language in Relation to a Unified Theory of the Structure of Human Behavior (The Hague: Mouton, 1967) on tagmemics and Werner Kummer, Grundlagen der Texttheorie (Hamburg: Rohwolt, 1975) on action theory.

[2] The concept of reality as a socially accepted model has allowed considerable advancement in the application of logical models to the study of language use, as in the works of Janos S. Petöfi.

[3] The technical concept of information as a correlate of the possibilities of elements in a sequence, as defined by Shannon and Weaver, must not be confused with this viewpoint. However, the set of expectations provides an informative alternative for stating ratios of information transmission in texts.

[4] Especially in computer languages like ELIZA developed by Joseph Weizenbaum, in which the computer can carry on a conversation with humans by means of such programs.

[5] See Peter Hartmann, Theorie der Grammatik (Mouton, 1963) on theoretical grammar; Götz Wienold, Semiotik der Literatur (Frankfurt: Athenäum, 1972) and Walter A. Koch, Textsemiotik und strukturelle Rezeptionsanalyse (Hildesheim: Olms, 1976) on semiotics. These works all use the terminology cited here.

[6] These are terms of Formalism, used by Roman Jakobson, Yurii Lotman, etc.

[7] Cf. Walter Kintsch and Teun van Dijk, "Comment on se rapelle et on résume des histoires," Langages, 40 (1975), 98-116.

[8] Jan Mukařovský, 'Standard Language and Poetic Language," in Paul Garvin (ed.), A Prague School Reader on Aesthetics, Literary Structure and Style. (Washington: Georgetown University Press, 1964), pp. 17-30.

[9] Michael Riffaterre, "Criteria for Style Analysis," Word, 15 (1959), pp. 154-74.

[10] Samuel R. Levin, "Internal and External Deviation in Poetry," Word, 21 (1965), pp. 225-37.

[11] Cf. James Thorne, "Poetry, Stylistics, and Imaginary Grammars," Journal of Linguistics, 5 (1969), pp. 147-50.

[12] For an early attempt to work with the concept of the "normal version," see Götz Wienold, Formulierungstheorie (Frankfurt: Athenäum, 1971).

[13] Such is also the approach of the phenomenological critic Roman Ingarden, Vom Erkennen des literarischen Kunstwerks (Tübingen: Niemeyer, 1968), who envisions a progression from "concretisation" toward "reconstruction."

[14] J.W. Chanslor, "Treasure from the Sea," in Science and the Sea (Washington: U.S. Naval Oceanographic Office, 1967), pp. 9-16.

[15] Websters Seventh New Collegiate Dictionary (Springfield, Mass.: Merriam, 1963), p. 539.